CLAIMS

1. A system architecture for a massively multi user application requiring massive concurrent data transactions comprising in a modular networked system of servers and of network services:

a plurality of application servers providing execution of services based on data from multiple users, a service comprising one or more processing tasks applicable to data not tied to the service;

one or more load balancing servers;

a network connection connecting application and load-balancing servers; and

one or more load balancing expert systems having access to a register of servers and a register of users, operable to monitor application server load and division of services on individual application servers and direct transfer of services between servers in order to: (i) facilitate and simplify calculations requiring data access and/or transfers; and (ii) to distribute server load to meet capacity of any given application server.

2. System architecture as claimed in Claim 1 in which the load balancing expert system does not direct physical transmission of services as such but either clones the original and initiates the operation of the clone, at the same time stopping the original and subsequently deleting the original; or services are preloaded on all servers before the start of an application, and the load balancing server directs the activation of a service on a new server, stopping the same service which was previously in operation on another server.

3. System architecture as claimed in any of Claims 1 to 2 which provides a linear communication chain from user to server, reducing the load on servers, wherein linear communication is provided by services operating parallel linear algorithms.

4. System architecture as claimed in any of Claims 1 to 3 wherein the load balancing expert system is operable to distribute and dynamically re-distribute data and/or services among the application servers based on one or more of:

(a) first information presenting a relative desirability of data for a service;

(b) second information representing a relative desirability of a service for an application server; and

(c) third information representing a processing load and / or spare processing capacity of an application server.

5. System architecture as claimed in any of Claims 1 to 4 also operable to monitor division of original data.

6. System architecture as claimed in any of Claims 1 to 5 where not only are the requests balanced amongst servers, but expert systems and services running on the servers are themselves mobile, and move from server to server to accommodate changing usage patterns, whereby memory requirements and computing requirements are minimised, event computation time and reporting are substantially real time and latency is minimised.

7. System architecture as claimed in any of Claims 1 to 6 wherein pluralities of the application servers are associated together as modules, each module being reconfigured to provide higher priority and/or speed intra-module communication than inter-module communication.

8. System architecture as claimed in Claim 7 wherein an expert system is configured to use

(i) services within a single module; and/or

(ii) data located within a single module.

9. System architecture as claimed in any of Claims 1 to 8 in which the load balancing expert system migrates two interdependent event tasks (ie services) or expert systems to the same server; or related data congregates together and services congregate with the data's final position, subject to allowable load on server and other heuristics, in order to access the data; or a service is moved from one server and split between two servers, in which case the service moves to both servers, and the applicable data in the form of different users, may be split between the two servers.

10. System architecture as claimed in any of Claims 1 to 9 in which the load balancing expert system operates on a single server or a cluster (module) of servers.

11. System architecture as claimed in any of Claims 1 to 10 which additionally comprises one or more user ambassador expert systems providing a confidential user interface, operable to transmit user requests and communicate results to individual users or user groups and operate on individual network protocols for each individual user.

12. System architecture as claimed in Claim 11 in which the network connection for connecting users is from the user to the user ambassador and is not accessible to any other part of the system, and the network connection for transmitting event instructions to the system and receiving reports is from the user ambassador expert system to the servers or server clusters (modules).

13. System architecture as claimed in any of Claims 1 to 4 which additionally comprises one or more service expert systems operable to perform

calculations relating to an event, preferably each service expert system comprises a plurality of services.

14. System architecture as claimed in any of Claims 1 to 13 which additionally comprises one or more user solution definition or solution selection expert systems operable to apply at least one solution or select at least one solution.

15. System architecture as claimed in any of Claims 1 to 14 which additionally comprises one or more event expert systems operable to calculate events to determine users affected by each event and subsequently compute the effect thereon, forward an event message to each user ambassador of affected users and implement the event.

16. System architecture as claimed in any of Claims 1 to 15 in which an application is an application wherein a user operating a terminal joins an operation on a processor or server, such as a board game, gambling game, locating game or application, training game or system, teaching system, dating match application, introduction service application, sport management game, such as football or horse racing management, shooting game, battle game virtual reality game etc.

17. System architecture as claimed in any of Claims 1 to 16 in which a "terminal" is a device or "platform" connected to a network and accessible to servers, such as a personal computer, console such as Playstation™, hand held device, mobile phone and the like.

18. System architecture as claimed in any of Claims 1 to 17 in which a server may has one or more services running on it that question servers on

their preferences and load, and question services on their preferences, a plurality of services needing to communicate, therefore comprising a plurality of load balancing expert systems; alternatively a single load balancing service is provided that queries all services and gets a summary of interrogation results.

19. System architecture as claimed in any of Claims 1 to 18 in which the load balancing expert system receives an overload alert from an application server or its corresponding software server, initiating load balancing.

20. System architecture as claimed in any of Claims 1 to 19 in which the load balancing expert system presents to each application server or software server a set of questions on relative desirability of any items in a list of event tasks (ie services) to be allocated and each server or software server grades these, and modifies this grading with time; and also presents to each service a set of questions on the relative desirability of a particular server as host, whereby services grade these on the basis of need for the data present on servers; and also questions every server or software server on its throughput and latency, receives replies and decides whether there is a need to reduce the load on any given server, looking at the list of responsibilities and using heuristics such as RAM and available CPU to sort by undesirability, selects one and offers it to a server or software server reporting high desirability or to a server or software server which is least heavily loaded.

21. System architecture as claimed in any of Claims 1 to 20 which provides for integrated server clustering and handover by means of the one or more load balancing servers being apprised of individual and module server load at any one time and being competent to direct communication between servers, including not only communication of data but the transfer of data where this

will speed up the interaction between server and data or where the need for data by the host server is less than that of the requesting server, and also the transfer of expert systems and task responsibilities or services where these become more appropriate to another server or can be more efficiently operated from another server.

22. System architecture as claimed in any of Claims 1 to 21 in which the load balancing expert system compiles server clusters or modules so that all expert system and data needs are local to a module and services needing the same data are local to a module, or modules are balanced in terms of RAM overload, CPU overload and other metrics.

23. System architecture as claimed in any of Claims 1 to 22 in which in the event that two solutions apply for calculating an event, these are dealt with in separate parallel algorithms, thereby maintaining linearity of communication.

24. System architecture as claimed in any of Claims 1 to 23 in which Parallel linear-algorithm expert systems are operated in a module cluster whereby they are able to access common information and data and are therefore always operating on the same dataset, in the event of a change in application circumstances.

25. System architecture as claimed in any of Claims 1 to 24 in which data is minimally duplicated throughout the system.

26. System architecture as claimed in any of Claims 1 to 25 in which the load balancing expert system allows modules or systems operating parallel algorithms and requiring access to the same datasets to be assigned to the same server or server module whereby they are able to directly access the data

without the need to make copies, and without the need for time and capacity consuming data requests or transfers requests.

27. System architecture as claimed in any of Claims 1 to 26 in which the use of expert systems operating parallel algorithms ensures that the application is readily scalable without system overload.

28. System architecture as claimed in any of Claims 1 to 27 which provides a scalar allocation of competency, one server has competency for locating an event to a global accuracy and hands over to the next server which has a competency for locating to a regional accuracy, which in turn hands over to a server which is competent to local or pixel perfect accuracy.

29. System architecture as claimed in any of Claims 1 to 28 in which each expert system in the system of the invention is developed around a key algorithm which is substantially linear having regard to the relation to events and users whereby an event may be related in a linear algorithm to a finite group of users and event messages may be reported to the same or a different finite group.

30. System architecture as claimed in any of Claims 1 to 29 which provides dynamic algorithm selection, whereby an algorithm suited to the prevailing dynamics of the application is selected and applied, for a suitable period until such time that the application dynamics become unsuited to that algorithm and an alternative algorithm is selected.

31. System architecture as claimed in any of Claims 14 to 30 in which a solution selection expert system comprises a linear algorithm which performs an initial solution selection which determines the nature of an event and

assesses the state of the application in play, makes a set of assumptions in order to assess the means by which users will be affected and selects a solution to limit the impact of the event to a reasonable number of users, whereby non affected users are not considered in the calculation of event message.

32. System architecture as claimed in Claim 31 in which assumptions are selected from a number of predetermined assumptions, such as shadow, line of sight, locality, terrain etc, and linear algorithms which may be selected for dynamic solution selection in an application according to the present invention include line of sight, shadow, quadrant, scalar, range, grid, etc and additionally include any solution which is selective to a dataset which is identified in and recorded in the system architecture.

33. System architecture as claimed in any of Claims 31 to 32 in which the load balancing expert system of the invention comprises data relating to the entire application and to subsets thereof and monitors the prevailing solution efficiency; and on detecting a decrease in efficiency it automatically selects and directs a change in solution for any given server and any given service on any given server at any given time whereby one solution is replaced by the directed solution.

34. System architecture as claimed in any of Claims 11 to 33 in which the modular system provides each user or group of users with an ambassador expert system operable for coordinating event messages from multiple events, coordinating related event messages from one event, such as sight and sound messages, and combining the modular event messages as a complete event message.

35. System architecture as claimed in Claim 34 in which the ambassador expert systems are intelligent, whereby they are associated with and are able to access memory banks and datasets relating to the user in question and assess whether an event message is feasible having regard to the user and his competence, whereby invalid messages may be detected and queried.

36. System architecture as claimed in any of Claims 34 to 35 in which the user ambassador expert system provides for user-user communication directly or via intervening respective ambassadors, wherein direct communication is in the form of chat rooms, auctions etc.

37. System architecture as claimed in any of Claims 34 to 36 wherein the ambassador expert system provides for independent reporting to users, whereby servers do not have to wait for each other and reporting and implementing event messages is not held up in the case that event calculation for one or more users is borderline and thereby protracted.

38. System architecture as claimed in any of Claims 34 to 38 wherein in the case of server overload or high server latency the server can drop borderline calculations; additionally the ambassador expert system is operable on a priority ranking of events and users, whereby the ambassador provides a final judgement on event message in borderline cases.

39. System architecture as claimed in any of Claims 34 to 38 wherein a user ambassador service on dedicated servers enables both simultaneous reporting and provides an alternative mechanism for delivery guarantee.

40. System architecture as claimed in any of Claims 34 to 39 wherein the ambassador expert system comprises a complete local dataset record of the

entire application as acknowledged received by the user, whereby any unsent messages can be detected, as a discrepancy with the application ~~operation~~ status at any time, whereby the ambassador simply sends the next message with the omitted message to update the user.

41. System architecture as claimed in any of Claims 1 to 40 comprising expert systems for dataset generation using spare system capacity at any time, generating iterative dataset calculations relating to the prevailing application which may be applied to solution calculations further enhancing linearity.

42. System architecture as claimed in any of Claims 1 to 41 comprising modular datasets representing the application whereby it is possible to update the application in respect of selected data only without the need to update an entire application dataset

43. System architecture as claimed in any of Claims 1 to 42 which comprises datasets relating to derivative maps only whereby update information does not need to be duplicated to a real map and whereby algorithms relating to the application can recognise all derivative maps universally by coordinate.

44. System architecture as claimed in any of Claims 1 to 43 in which servers include modular layers or levels hosting various systems and services as hereinbefore defined, levels being distinguished by networking, access, competency level, RAM access etc.

45. System architecture as claimed in any of Claims 1 to 44 which incorporates a neural network for pattern recognition in information and derivative maps.

46. A method for hosting or using a massively multi-user application as hereinbefore defined in any of Claims 1 to 45 comprising providing a system architecture as defined, comprising a plurality or application servers, and a load balancing expert system as defined, adapted to a generic application, or customised to a particular application.

47. A user terminal for networking to a massively multi-user application system architecture as hereinbefore defined in any of Claims 1 to 45.

48. A user interface for interfacing to a massively multi-user application system architecture as hereinbefore defined in any of Claims 1 to 45.

49. A datafile for a massively multi-user application system architecture as hereinbefore defined in any of Claims 1 to 45 selected from an event log, user data information, information map, derivative map and the like.

50. A datalog for a massively multi-user application system architecture as hereinbefore defined in any of Claims 1 to 49 for classification of events by all features, given as snapshot or historical record.

51. A dataset of rules for a massively multi-user application system architecture as hereinbefore defined in any of Claims 1 to 45 by which the system determines precedence of conflicting event messages for a user.

52. A machine readable medium comprising system architecture software for a massively multi-user application as hereinbefore defined in any of Claims 1 to 45.

53. A method for controlling and directing the development of an application to be supported by the system architecture of any of Claims 1 to 45, with the use of the system architecture as a development means.

54. The use of a known or novel linear algorithm or known power algorithm modified in novel manner to a linear algorithm in the system of the invention as hereinbefore defined in any of Claims 1 to 45.

55. A novel linear algorithm for an expert system as hereinbefore defined in any of Claims 1 to 45, in particular for a solution as herein defined or illustrated in the examples.

56. The use of a known expert system in the system of the invention as hereinbefore defined in any of Claims 1 to 45.